We claim:

1. A method of depositing an optical quality silica film by PECVD (Plasma Enhanced Chemical Vapor Deposition), comprising:

a) independently setting a predetermined flow rate for a raw material gas;

b) independently setting a predetermined flow rate for an oxidation gas;

c) independently setting a predetermined flow rate for a carrier gas;

d) independently setting a predetermined total deposition pressure; and

e) applying a post deposition heat treatment to the deposited film at a temperature selected to optimize the mechanical properties without affecting the optical properties determined in steps *a* to *d*.

2. A method as claimed in claim 1, further comprising independently setting a predetermined flow rate for a dopant gas.

3. A method as claimed in claim 2, wherein the observed FTIR characteristics of the deposited film are monitored to determine the optimum post deposition heat treatment temperature.

4. A method as claimed in claim 1, wherein the post deposition heat treatment temperature lies in the range 600 to 900°C.

5. A method as claimed in claim 4, wherein the deposition is carried out at a temperature in the range 100 to 650°C.

6. A method as claimed in claim 5, wherein the deposition is carried out at a temperature of about 400°C.

7. A method as claimed in claim 1, wherein the raw material gas is selected from the group consisting : silane, SiH_4; silicon tetra-chloride, $SiCl_4$; silicon tetra-fluoride, SiF_4; disilane, Si_2H_6; dichloro-silane, SiH_2Cl_2; chloro-fluoro-silane $SiCl_2F_2$; difluoro-silane, SiH_2F_2; and any other silicon containing gas containing hydrogen, H, chlorine, Cl, fluorine, F, bromine, Br, or iodine, I.

8. A method as claimed in claim 7, wherein the oxidation gas is selected from the group consisting of: nitrous oxide, N_2O; O_2, nitric oxide, NO_2; water, H_2O; hydrogen peroxide, H_2O_2; carbon monoxide, CO; and carbon dioxide, CO_2

9. A method as claimed in claim 8, wherein the carried gas is selected from the group consisting of nitrogen, N_2; helium, He; neon, Ne; argon, Ar; or krypton, Kr.

10. A method as claimed in claim 2, wherein the dopant gas is selected from the group consisting of phosphene, PH_3; diborane, B_2H_6; Arsine (AsH_3); Titanium hydride, TiH_4; germane, GeH_4; Silicon Tetrafluoride, SiF_4; and carbon tetrafluoride, CF_4.

11. A method as claimed in claim 2, wherein the raw material gas is SiH_4, the oxidation gas is N_2O, the carrier gas is N_2, and the dopant gas is PH_3.

12. A method as claimed in claim 11, wherein the SIH_4 gas flow is set at about 0.2 std liters/min., the N_2O gas flow is set at about 6.00 std liters/min., the N2 flow is set at about 3.15 liters/min., and the PH_3 is set at about 0.50 std liters/min.

13. A method of depositing an optical quality silica film by PECVD (Plasma Enhanced Chemical Vapor Deposition), comprising:

a) independently setting a flow rate for SiH_4 at about 0.2 std liters/min.;

b) independently setting a flow rate for N2O at about 6.00 .2 std liters/min.;

c) independently setting a flow rate for a carrier gas;

d) independently setting a predetermined total deposition pressure; and

e) applying a post deposition heat treatment to the deposited film at a temperature between 600° and 900°C selected to optimize the mechanical properties without affecting the optical properties determined in steps *a* to *d*.

14. A method as claimed in claim 13, wherein the carrier gas is N_2 and the flow rate is set at about 3.15 2 std liters/min.

15. A method as claimed in claim 14, further comprising independently setting a predetermined flow rate for a dopant gas.

16. A method as claimed in claim 15, wherein the dopant gas is PH_3 and the flow rate is set at about 0.50 std liters/min.

17.., A method as claimed in claim 15, wherein the total deposition pressure is set at about 2.6 Torr.

18. A method as claimed in claim 13, wherein the observed FTIR characteristics of the deposited film are monitored to determine the optimum post deposition heat treatment temperature.

19. A method as claimed in claim 13, wherein said deposited film forms a buffer, core or cladding of an optical component.

20. A method as claimed in claim 19, wherein said optical component is a multiplexer or demultiplexer.